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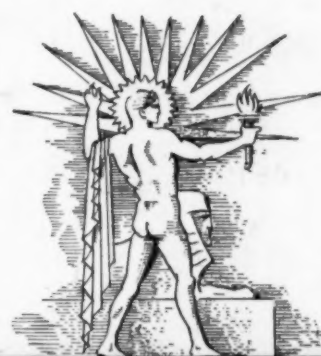
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FEB 24 1941

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •



February 22, 1941

Well!

See Page 121

A SCIENCE SERVICE PUBLICATION

Do You Know?

About 55% of the world's people are in Asia.

A troop of *howler monkeys* can be heard calling over distances of more than a mile.

A simple device for quickly measuring *moisture* in a forage or grain crop has been devised by an Ohio State University scientist.

Modern mining methods make it profitable to employ *deep mining* for such everyday products as limestone and common salt.

One Canada *goose* at an Oregon wildlife refuge has the habit of following automobiles several miles, keeping up to 54 miles an hour.

To aid Brazil in producing *rubber* free from leaf-blight disease, the United States has sent 204,000 selected seeds by army bombing plane.

Rice was grown in the Far East before 1000 B.C., but its spread to wide areas apparently occurred mainly between 1000 B.C. and 1000 A.D.

A head-on collision between the earth and a *comet* is possible, though not probable, says Prof. W. H. Barton, Jr., of the Hayden Planetarium.

Ancient Egypt had two leading types of *hunting dogs*: one, prick-eared, was apt to have tightly curled tail, the other, lop-eared, had an extended tail.

QUESTIONS DISCUSSED IN THIS ISSUE

Most articles which appear in SCIENCE NEWS LETTER are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.

AERONAUTICS

How can an airplane engine be built for \$350? p. 121.

How has an amusement park device been put to serious work by a parachute company? p. 118.

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ANTHROPOLOGY

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ARCHAEOLOGY

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ASTRONOMY

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ENTOMOLOGY

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HEALTH

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Why does typhoid vaccination increase the difficulty of diagnosing acute appendicitis? p. 120.

METEORITICS

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NUTRITION

What quick frozen food is a delicacy for chickens? p. 117.

PHARMACY

What forms of blood will be listed in the Pharmacopoeia? p. 121.

PHYSICS

How does the magnetism of the earth compare with what it was in long past geologic ages? p. 119.

Why is Nazi radio reception better in South America than in North America? p. 119.

PSYCHOLOGY-AERONAUTICS

How does the R.A.F. crew learn to navigate a plane? p. 125.

PUBLIC HEALTH

What articles are included in the layette sent by the Children's Bureau to Peru? p. 116.

Sphagnum moss, used in dressing field wounds by the British, was similarly used in Ireland as far back as 1014.

"Two homely parents can have beautiful children and two beautiful parents can have homely children," writes Dr. Alexander S. Wiener in the *Scientific Monthly*.

First use of *magnesium-thermite* bombs to start fires in war was made by Italians in Ethiopia in 1936.

Danish scientists who examined *prehistoric plants* or their impressions on clay vessels in British museums, have described the wheat, barley, oats, woad and other crops of early England.

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BACTERIOLOGY

Watching Invisible Viruses May Solve Cancer Problem

New Electron Microscope Reveals Chemical Interaction Of Virus Molecules With Others; Like Seeing Disease

WATCHING invisible viruses at work, a feat now possible with the aid of the electron microscope, is yielding clues that may lead to solution of the cancer problem. Fresh evidence for the theory that viruses are the cause of cancer has already been obtained, it appears from studies reported by Dr. Wendell M. Stanley, of the Rockefeller Institute for Medical Research, on receiving the 1941 gold medal of the American Institute.

Dr. Stanley has isolated the virus which causes mosaic disease of tobacco plants and found it to be not only a disease germ but a crystalline chemical. With the electron microscope, which lets scientists see in photographs particles far too small to be seen through even powerful microscopes, Dr. Stanley and an associate were able to follow the interaction of tobacco mosaic virus molecules with certain smaller molecules.

This is like seeing disease viruses at work. If scientists can see far enough in this way, they might be able to follow the chemical process by which a cancer-causing virus, if it exists in the body's cells in a latent or masked form, is stirred into action.

"Several cases of the harboring of viruses by presumably normal cells," Dr. Stanley explained, "have already been discovered. For example, practically all of the potato plants grown in the United States are known to carry a virus. The plants might be regarded as normal, for the presence of this infectious agent, known as the latent mosaic of potato virus, cannot be demonstrated readily so long as one works with plants carrying the virus. Its presence can be demonstrated easily, however, by applying extracts of such plants to certain other plants, such as Turkish tobacco, which respond to the virus with obvious disease symptoms."

New and better vaccines for protection against virus diseases, which range from tobacco mosaic to yellow fever, influenza and infantile paralysis, may result from scientists' new-found ability to watch these invisible substances at work and

from knowledge that they are chemicals whose structure can be altered as can that of other, well-known chemicals. Such alterations in the chemical structure of a virus might yield a protective vaccine, and it might also lead to the "production of new and useful strains of viruses."

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AERONAUTICS

Post With Plunger Protects Planes in Crash

INJURY to an airplane pilot and his passengers, and serious damage to the plane, will be prevented, even if it noses over as it touches the ground and lands on its back, provided it is equipped with a device invented by Alexander P. de

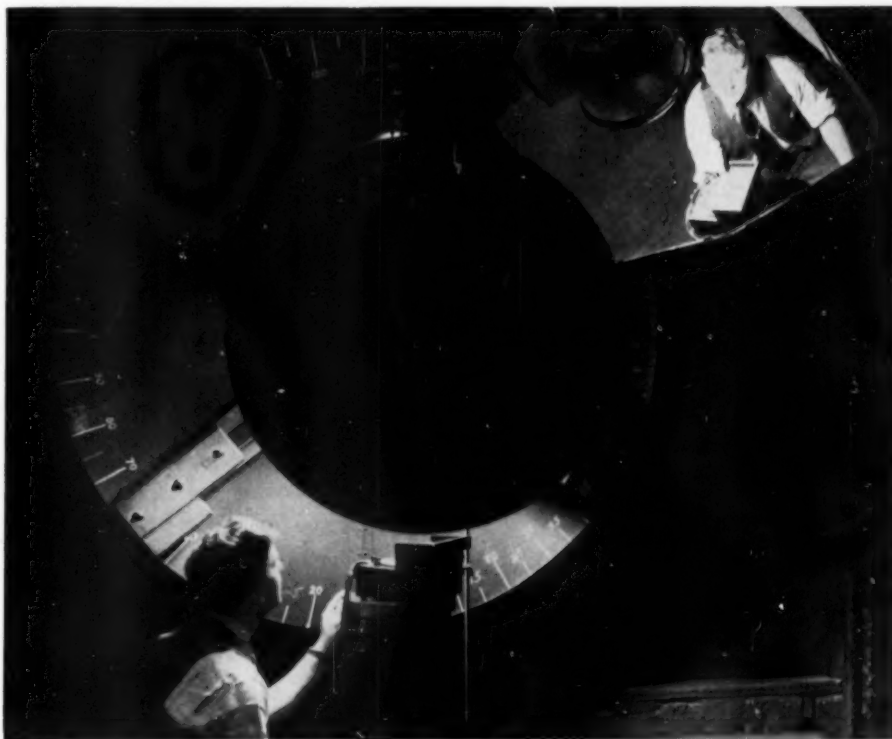
Seversky, president of the Seversky Aircraft Corporation. The United States Patent Office has just granted him patent 2,230,614 for the invention.

It consists of a post which projects up from the fuselage, behind the pilot, to such a height that, if the plane does nose over, it receives the impact. Padded on the top and with a hydraulic plunger inside, it yields gradually, thus taking up the shock so that, the inventor states, "the occupants will not even be jarred if the plane lands on its back."

As the projecting post would interrupt the flow of the airstream, and reduce the plane's speed, it is normally retracted. It is connected with the retractable landing gear, so that, when the wheels are lowered for landing, the cover over the post opens and it is raised in place.

Leslie Everett Baynes, of Bourne End, England, was granted patent 2,230,370 for a new type of airplane which combines the usual type with a helicopter, raised by the rotation of large horizontal propellers. This is provided with a rather small wing area, enough to sustain the craft in straight flight, but not enough to enable it to take off.

As the ship leaves the ground, the pro-



IT'S DONE WITH MIRRORS

This light distribution test is one of a number of intricate check-ups given lamp units at the General Electric Illuminating Laboratory. The mirror at the upper right reflects light from the unit back to a photo cell at the other end of the room. Movement of the mirror gives light readings in the vertical plane, rotation of the lamp unit gives readings in the horizontal plane.

pellers turn horizontally, or tilt slightly forward, and thus give extra lift. When in flight, the pilot can move the propellers to turn in a vertical plane, then they give maximum speed ahead. In landing, they are moved upwards, and nearly vertical descent is possible.

Mr. Baynes assigned his patent to Alan Muntz and Company, Ltd., of Hounslow, England.

Science News Letter, February 22, 1941

PUBLIC HEALTH

Children's Bureau Layette For Washington's Birthday

WHEN the Father of His Country was ushered into the world on a February day 209 years ago he was probably given for wearing apparel many layers of undergarments, very long dresses, socks, mitts and caps, the latter to be worn both day and night. Babies born on February 22 this year, the day now celebrated as Washington's birthday, will be well dressed, according to modern scientific ideas, with very much scantier wardrobes.

The staff of the U. S. Children's Bureau sent a layette to a baby born in Lima, Peru, on Washington's Birthday, as a token of friendship and in return for a similar courtesy extended to a poor baby of Washington, D. C., by Senora Rosalia Lavalle de Morales Macedo, wife of one of the Peruvian delegates to the Eighth Pan American Scientific Congress. The layette was taken to Lima by Mrs. Elizabeth Shirley Enochs, when she went as representative of the Children's Bureau chief, Miss Katharine F. Lenroot, to a meeting in Montevideo of the International American Institute for the Protection of Childhood.

The layette consisted of a pink silk coat and bonnet, a blue knitted jacket and bootees, three short, hand embroidered dresses, two slips, three cotton shirts, one dozen diapers, two knitted cotton nightgowns, one can of baby powder, two cakes baby soap, one box of cotton swabs for cleaning a tiny nose, one bath towel, two washcloths, one crib blanket and one receiving blanket for use after baby's bath. A few supplementary items were to be purchased by Mrs. Enochs in Lima.

The layette might serve as a guide to mothers in other American countries. Such fancy items as the silk bonnet and coat, embroidered dresses and slips, are not essential if the budget for the expected baby's wardrobe is small. The diaper,

nightgown, blanket and towel allowance might well be increased.

Baby should have his own individual towels, washcloths and toilet articles, to

cut down the risk of germ infections. His clothes should be easy to put on and off, and they should give him comfort and freedom for kicking and stretching.

Science News Letter, February 22, 1941

ARCHAEOLOGY

Find Homes of Plain Citizens Of Mayan Civilization

THROWING light on the home life of ancient America's plain citizens over 1,000 years ago, when the brilliant Mayan Old Empire in the tropics was America's leading civilization, two prehistoric Mayan homes have been unearthed in British Honduras, J. Eric S. Thompson has just reported to the Carnegie Institution of Washington.

Excavations at the ruined "city of the stone lady," Xunan Tunich, near the Honduras-Guatemala border, show that a wide gap existed between lower and upper classes in the Mayan Indian world, Mr. Thompson reports. Indian farmers, who made up the masses of the Mayan population, were concerned with their pottery making, basketry, weaving, and worship of simple earth gods. The erudition of the Mayan priests, mathematicians and astronomers, which amazes archaeologists today, not only went over the heads of the common people but the lofty scholars moved in a different world.

They even worshipped different gods, some concerned with more esoteric matters than the rain and winds and soil.

Mr. Thompson, who is now in the United States, made the discoveries just reported during his past season's work there.

The two buildings which he identifies as presumably Mayan homes were occupied during several generations and were extensively rebuilt and repaired by the tenants. One home is a one-room affair, small and with vaulted roof. The other is more pretentious, and Mr. Thompson excavated six of its rooms.

Handiwork of the people provides significant clues to the two sharply divided classes of Mayan society. From studying decorated pottery in the ruins, Mr. Thompson has been able to divide the history of the ruined settlement into six culture phases, marked by a succession of art styles.

Science News Letter, February 22, 1941

ANTHROPOLOGY

Bones of Incas to Be Studied By American, Off to Peru

NEW LIGHT on physical types of the conquering Incas and other prehistoric Indians whom the Incas fought and welded into ancient America's biggest empire will be sought in Peru by Dr. T. Dale Stewart of the Smithsonian Institution.

Setting out Feb. 28, on a one-man anthropological expedition, Dr. Stewart hopes to study skulls and other skeletal remains from such ruins as the holy Incan city of Pachacamac, and the famous cemetery of Paracas on the coast, where quantities of mummies of pre-Incan days have been unearthed from the sand and unwrapped.

Getting better acquainted with remains of the ancients in Peru itself will aid the Smithsonian Institution in study of the

remarkable Indians who evolved high aboriginal civilization in South America. From an expedition made by Dr. Ales Hrdlicka about 30 years ago, the Smithsonian possesses four or five thousand skulls of Peru's ancient people.

Quantities of such skulls in the past have been cast aside in Peru's pre-historic cemeteries by amateur digging parties in frantic search for Incan gold or for the lovely woven fabrics and decorated pottery of the ancient people, which might be sold. Dr. Stewart's expedition is expected to add to the Smithsonian's collections new skeletal material.

With progress in excavating Peru's ancient cities, the physical types that inhabited highland and sandy coast in several thousand years of Indian develop-

ment can be differentiated. Bones become clues to the migrations and changing fortunes of ancient American groups.

Hope of learning more about antiquity of the Peruvian surgical practice of trephining, or cutting a hole in the skull,

is held by Dr. Stewart. This major operation served to release pressure although the Indians apparently thought of it mystically as a way of letting out evil.

Science News Letter, February 22, 1941

MEDICINE

Sulfanilamide May Prove Rheumatic Fever Preventive

Establish Record of No Attacks Among 55 Patients Taking Treatment From November Through June Annually

INCREASED hope that sulfanilamide may prove the means of preventing rheumatic fever attacks appears in a report to the *Journal of the American Medical Association* (Feb. 15) and in editorial comment on that report.

A record of no rheumatic fever attacks among 55 patients while taking continuous sulfanilamide treatment from November through June of each year between 1936 and 1940 is announced by Dr. Caroline Bedell Thomas, Dr. Richard France and Dr. Franjo Reichsman, of the Johns Hopkins Hospital and University. During the same four years, 15 major attacks of acute rheumatic fever occurred among 150 patients not taking sulfanilamide during the control period.

Rheumatic fever is a very widespread disease which seriously damages the heart and leads frequently to early death. More than 900,000 persons in the United States are said to suffer from rheumatic heart disease. It is the chief cause of death among school children and is responsible for at least 30,000 deaths annually in the United States.

The exact cause of rheumatic fever has not been discovered. Infection with the beta hemolytic streptococcus usually precedes attacks and this germ is thought to play a significant role in starting the disease. This germ is the one over which sulfanilamide accomplished its earliest triumphs, saving mothers whose lives were threatened by this streptococcus during childbirth.

Because of these facts, sulfanilamide was tried as a treatment for patients suffering rheumatic fever attacks. It was not successful in these cases and there was some evidence that it might be dangerous. The Baltimore doctors, however, and Dr. A. F. Coburn and Dr. Lucile V. Moore, of New York City, decided to try it, not as treatment, but as

a preventive of recurring attacks of the disease. Authorities generally agree that the patient who survives his first attack of rheumatic fever would have a good chance of living out a normal life span if he could be protected from these repeat attacks with their added injury to the heart.

As early as 1939, the Baltimore and New York doctors reported that major attacks of rheumatic fever did not occur, or occurred in only 1% of patients given sulfanilamide prophylaxis during the winter and spring months when streptococcus infections are most numerous. The present report of experience over four years adds to the hope that sulfanilamide prophylaxis of rheumatic fever will prove successful.

The drug is given twice daily in doses smaller than those used for treatment of disease. No serious toxic effects were observed. The editor of the *Journal of the A. M. A.* comments on the "hopeful picture" the report gives and adds:

"The final evaluation of this method of prevention awaits results obtained in large, carefully controlled series of young rheumatic subjects. In view of the widespread occurrence and the crippling effects of rheumatic fever, it is to be hoped that interest in and support for such projects will be sufficient to permit a final evaluation of this promising lead in the prevention of rheumatic fever."

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NUTRITION

Frozen Dough for Cookies; Frozen Grass for Chickens

FROZEN cookie dough that can be kept a year before baking, frozen grass for chicken feed, and frozen flowers for wintertime parties are news from the chilly realm where research workers are

adding more and more things to the list that can be frozen for a convenient future.

Putting various kinds of batter and dough through the quick freezing process—that gives us fresh-tasting strawberries and peaches now at all seasons—three home economists at Purdue University have been baking with material kept frozen up to a year.

Cakes which they baked from batter frozen and stored four months taste just like fresh-batter cakes, they found by handing out samples to critical helpers. Stored longer than four months, the cake dough was not so successful, they stated, reporting these experiments to the *Journal of Home Economics*.

Cookie doughs kept frozen a year turned out cookies just like freshly mixed batches of cookies, they learned. Pies baked from pastry dough nine months in storage were like freshly made pies. Rolls were "acceptable" when made from frozen-stored dough kept up to six weeks. Beyond that time, "off" flavors were detected.

Prospect that quick-frozen batters and doughs of many kinds may become commercial products for bakeries and may be added to the line of frozen foods in groceries is foreseen as a result of these tests.

Frozen grass for human eating and for the chickens has passed the experimental stage and become a new commercial product. Made from cereal grasses, cut when the growing grass is at the peak



WORLD'S BIGGEST WHEEL

This giant is for the big Douglas Air Corps bomber and is about 23 times the weight of the young lady who stands beside it.

of nutritive value, the grass product is a dried and powdered green flour which is stored at near zero Fahrenheit to preserve its vitamin content. A vitamin drink for humans and a mash for poultry are the forms the grass food takes when actually consumed. That the product is 10 to 80 times as rich in certain vitamins as fresh fruits and vegetables is the report of the laboratory producing the refrigerated grass food.

Gladioli, quick-frozen in the opening bud stage, have been held there several

months waiting a chance to blossom as if their opening had never been interrupted in experiments which promise to make the idea of flowers in season a quaint and old fashioned memory.

And to round out a picture of ours as a frozen age, are such current developments as frozen blood plasma for keeping blood for vital transfusions and the saving of babies' lives by freezing mothers' milk into wafers and shipping it as needed.

Science News Letter, February 22, 1941

AERONAUTICS

Whirling From 50-Foot Tower New Test For Parachutes

Adaptation of the Amusement Park Airplane Ride Shows Faults of 'Chutes by Slow Motion Pictures

PARACHUTE testing might seem to be a rather perilous task, like distinguishing between mushrooms and toadstools by noticing whether or not you are alive the morning after you eat them.

Of course, it is possible to tie a man-sized sandbag to a chute, and drop it from a plane, but then it is hard to observe exactly what happens when it opens.

To avoid these difficulties and make feasible the testing of these aerial life-

belts to assure that they will operate the way they should when they are needed, a novel method has recently been introduced at Manchester, Conn., by the Pioneer Parachute Company, now operating on a 24-hour basis supplying chutes to the Army and Navy.

The testing equipment is an ingenious adaptation of the amusement park airplane ride—the kind where little airplane-shaped cars are suspended by cables from a huge horizontal wheel on top

of a tower. When the wheel is revolved, the cars are thrown outwards by centrifugal force, and the riders whiz through space at a high speed.

Floyd Smith, Vice-President of the company, himself a pioneer in the parachute business, worked out the new method. On a hillside a few miles from the plant a fifty-foot tower has been erected. At the base is a 320 horsepower Diesel engine, connected by a shaft to a revolving rigging at the top. Attached to this is a dummy, with a parachute pack attached to its back, which can be spun around at speeds ranging from 70 to 300 miles per hour.

When the whirling dummy is going at the desired speed, the parachute is automatically released. Then, with the dummy, it gently floats to earth. This, of course, happens so fast that the eye cannot follow the action. So a 16 mm. movie camera, speeded up 7.5 times, to take 120 frames per second, films the whole process.

The camera is attached to the rigging, revolving with it. It starts just before the parachute is released, so every detail is recorded, for future study.

Some surprising, and enlightening, facts have been discovered. For instance, the little "pilot" chute, supposed to open first and serve as an anchor to aid the unfolding of the big umbrella, in many cases was the last thing to open. This represented a possible source of danger since it might foul the main canopy and the lines holding the user. So an improved pilot was devised, and a way found to pack it so it would always open first.

The studies also showed how the main parachute could be packed to avoid another source of failure. This happened with the older packing methods when the skirt of the canopy tilted upwards in opening, spilling the air out.

The armed services of Canada, England and South American nations, as well as our own country, have sent representatives to inspect the tower and its work, says Mr. Smith. He foresees rapid strides in parachute development, not only for bringing aviators from damaged planes safely to the ground, but also for the safe dropping of heavy bodies, such as boxes of supplies to an isolated location.

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SIMULATED JUMPS

Parachute jumps of several miles at least would be needed to duplicate the speed which the testing dummy attains in this device for finding why parachutes sometimes do not open as they should.

Traditional luck of the farmer's wife with *house plants* in the kitchen is largely due, says a botanist, to the vapor pouring steadily from the kettle on the range into a moderately heated room—very different from hot, dry city dwellings.

PHYSICS

Society Honors Centenary Of First Magnetic Observatory

**Just a Hundred Years Ago, Alexander Dallas Bache
Started Observations Where Girard College Now Stands**

COMPLETION of a century of scientific observations in the United States of the earth's magnetism were commemorated by the American Philosophical Society, oldest American scientific society, in a series of meetings on Feb. 14 and 15 in Philadelphia.

It was just about a century ago that Alexander Dallas Bache, one of the greatest scientific figures of the first part of the 19th century, started his systematic observations. These were made in a special non-magnetic building erected on the grounds of Girard College, of which he was then president.

Bache was born in Philadelphia in 1806, the great-grandson of Benjamin Franklin, grandson of Alexander J. Dallas, Madison's secretary of the treasury, and nephew of George M. Dallas, Vice-President under Polk, after whom Dallas, Texas, is named.

According to his report, the observatory was begun in 1838, and finished in 1840, though it was not until 1841 that the instruments were entirely in place and full measurements of the variation in the earth's magnetism were being made.

Science News Letter, February 22, 1941

Earth's Magnetism Same

MILLIONS of years ago, in long past geologic ages, the magnetism of the earth was essentially similar to what it is today, Dr. A. G. McNish, of the Carnegie Institution of Washington's Department of Terrestrial Magnetism told the Centenary meeting.

Dr. McNish has measured what he terms "fossil magnetism." As the particles which later hardened to form the sedimentary rock were laid down in past ages, in quiet bodies of water, tiny magnetic particles were among them. Their orientation was determined by the magnetic field of the earth at that time. As more material was deposited on top, they were locked in positions which they have held until now. Thus, by measuring their direction and magnetic intensity,

some idea may be gained of the magnetic conditions of long ago.

"Measurement of this fossil magnetism reveals that the earth's field was not essentially different in past geologic ages from what it is today in the same locality," said the speaker. "Large changes have occurred but they seem to have been no greater than the changes which were observed during the past four centuries, and the rapidity with which they occurred corresponds to present-day rates.

"Thus, the evidence so far derived from study of fossil magnetism supports the belief that the earth's magnetism consists of a relatively constant uniform field upon which is superposed an irregular field of considerable magnitude which varies slowly as measured by human standards but extremely rapidly as measured by the standards of geological and astronomical time."

Most of the phenomena of the earth's magnetism and its electricity, which is related, are only observed with special instruments, Dr. O. H. Gish, of the Carnegie Institution, said. Occasionally, he explained, they are more noticeable, as was the case in the magnetic storm of last Easter Sunday.

Then, he stated, "an electromagnetic disturbance, beginning about two hours after Greenwich noon and lasting about twenty-four hours, attained unsurpassed severity at intervals. This was accompanied by unprecedented obstruction of transatlantic radio transmission, numerous interruptions of wired communication services, and, most surprisingly, some interference with operations of electric power systems. Also aurorae were seen farther than usual from the polar regions.

"The disruption of radio communication is attributable to changes in the electrical properties of the high atmosphere (ionosphere) which involve deterioration of the mirror-like reflection of radio waves from that region back to earth. The interference with wire communication and electric power transmission doubtless arose from intrusion of

electric currents—induced in the earth by the magnetic variations—which on this occasion were more than one thousand times the usual intensity."

Science News Letter, February 22, 1941

Nazi Radio Is Aided

NAZI propaganda via the radio waves travels from Europe to South America better than it does to North America. Speaking at the meeting commemorating the centenary of the first American magnetic observatory, Dr. J. H. Dellinger, chief of the Radio Section of the National Bureau of Standards, told of ways in which the earth's magnetism affects wireless transmission.

"It has long been known," he stated, "that radio transmission on the high radio frequencies is markedly poorer between North America and Europe than over other transmission paths. A possible relation of the radio anomaly to the propinquity of the magnetic pole was suspected, but there were no data on which to base a positive conclusion.

"Following a discovery that this disparity existed at the broadcast frequencies also, a systematic study was begun in 1935 and is still in progress. Measurements have been made in Europe and in North and South America of the received intensities of broadcast stations in the other continents, each (northern) winter since 1935."

Disturbances in the ionosphere, the complicated layer more than fifty miles high from which radio waves are reflected back to earth, are associated with the magnetic storms at lower levels, said Dr. Dellinger.

These, he stated, "increase the variability of radio transmission between North America and Europe much more than between South America and either North America or Europe. The ionospheric and magnetic storminess, moreover, is prevalent much more of the time in the more northerly regions traversed by the radio waves between North America and Europe. Thus this transmission path is far more subject to the disturbing effects than the paths more remote from the polar regions."

Magnetic disturbances on the earth are closely connected with the activity of the sun. In addition to the effect of the general magnetic storminess, there is another. Dr. Dellinger described this as "a very sudden, relatively brief perturbation occurring simultaneously throughout the day hemisphere, the effect being a maximum at the subsolar point and a mini- (Turn to page 126)

BIOLOGY—BALLISTICS

Viruses May Show Way to More Effective Bullets

PRODUCTION of more effective bullets and torpedoes for national defense might be achieved with the aid of the virus that causes mosaic disease of tobacco plants. This suggestion of a way to mobilize disease viruses for defense comes from Dr. Wendell M. Stanley, Rockefeller Institute scientist who isolated tobacco mosaic virus as a crystalline chemical substance.

"Solutions of tobacco mosaic virus could be used to study the flow currents in apparatus such as pumps and hydraulic rams or the nature of flow when boats or projectiles move through a liquid," Dr. Stanley told members of the American Institute.

This use of tobacco mosaic virus solutions depends on the fact that they "exhibit what is known as double refraction of flow. When examined by means of polarized light," Dr. Stanley said, "the flowing stream is found to be doubly refracting, whereas when quiescent the same material is not doubly refracting."

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ENTOMOLOGY

Red Scale Insects Resist Death by Holding Breath

THE secret of resistance of certain red scale insects, among the most important of citrus pests, to drastic control measures used by citrus growers has been uncovered: they can hold their breath for more than a half-hour at a time.

Dr. Roderick Craig and Dr. N. W. Hardman of the University of California have found that shortly after resistant red scales are exposed to cyanide gas they close two pairs of holes, called spiracles, through which air enters their bodies. They can keep these holes closed for at least thirty minutes, time enough for at least 20% of the insects to escape death. Since practical control requires a kill of 98% to 99%, cyanide fumigation is useless for control of resistant red scales. Petroleum oil sprays will control resistant red scales but are much more expensive and besides are harmful to the trees.

Non-resistant scales, say Drs. Craig and Hardman, can keep their spiracles closed for only about one minute, after which the holes open and the lethal gas enters their bodies.

Hundreds of thousands of dollars are

now spent annually to control red scale. Since 1922 the resistant type has been spreading over larger areas every year. At present Drs. Craig and Hardman are attempting to find some substance which can be combined with cyanide to force the resistant scales to open their spiracles, thus allowing the gas to enter their bodies.

Science News Letter, February 22, 1941

MEDICINE

Typhoid Vaccination Affects Appendicitis Diagnosis

SPECIAL care in interpreting the blood test used in diagnosis of acute appendicitis will be necessary in the case of men recently inducted into army service, Dr. Hugh McKenna, of Chicago, warns the younger medical officers of the army.

World War experience with appendicitis in military hospitals forms the basis of Dr. McKenna's note. (*Journal, American Medical Association*, Feb. 8.)

The white blood cell count, frequently used in diagnosing acute appendicitis is lower, Dr. McKenna points out, following the triple typhoid vaccination now used in the army.

"The blood picture sometimes puzzled medical officers in making a prompt diagnosis of acute appendicitis," Dr. McKenna says of World War days. "Any factor which may delay a decision in making a prompt diagnosis in acute appendicitis is hazardous and must be corrected in order that surgery may not be delayed."

Science News Letter, February 22, 1941

CHEMISTRY

Wrappers Reduce Losses in Australian Citrus Fruits

WRAPPING oranges and other citrus fruits in paper treated with diphenyl, a method originated by Dr. Adalbert Farkas of Hebrew University, Jerusalem, has been used with marked success by citrus growers in New South Wales, Australia. Word of the experiments has just reached the American office of the University in New York. Losses of fruit in the treated wrappers were from two-thirds to three-fourths less than losses in control lots of similar fruit kept in ordinary untreated wrappers.

Dr. Farkas was formerly on the faculties of the Technical College in Vienna and the University of Frankfurt-am-Main. After leaving Germany, he was for a time at the University of Cambridge, England.

Science News Letter, February 22, 1941

IN SCIENCE

MEDICINE

U. S., Canadian Physicians May Practice in England

ASPECIAL defense regulation has been passed to enable U. S. and Canadian physicians to practice in the United Kingdom so that they can "give practical expression to their belief that our cause is their cause by placing their services at the disposal of the British government as long as the emergency lasts," the London correspondent of the American Medical Association reports.

At the same time the 40-year-old English medical reciprocity with Italy has been ended.

Science News Letter, February 22, 1941

METEORITICS

Meteorite Fragments Received by Smithsonian

METEORITE fragments totaling about two pounds in weight have been received by the Smithsonian Institution from scientists in the USSR; it required a special act of the Central Soviet to permit their export from Russian soil. Not valued particularly for their size, the pieces of celestial stone and iron were very much desired here for purposes of chemical analysis, to compare with meteorites that have fallen in other parts of the earth.

One piece is a slice weighing about half a pound (220 grams) from an iron meteorite that fell near the city of Boguslavka, Siberia, in 1916. The remainder of the specimens are fragments of a stony meteorite that fell at Lhotnevyi, Ukraine, in 1930; their total weight is about one and one-half pounds (700 grams).

E. P. Henderson, Smithsonian mineralogist who is analyzing the specimens, states that his Russian colleagues who specialize in the study of meteorites are an exceptionally progressive group of scientists, and that they have cooperated well with American workers in the same field.

The legislation necessary for the export of the meteorite fragments was passed upon the recommendation of the Academy of Sciences of the USSR.

Science News Letter, February 22, 1941

NE FIELDS

MEDICINE

Vitamin K Injected Into Veins to Stop Bleeding

SUCCESS in giving the anti-bleeding vitamin K by injection into the veins of patients too sick to take it by mouth was announced by Dr. Edward R. Anderson, Dr. John E. Karabin, Dr. Herbert Udesky and Dr. Lindon Seed, of the University of Illinois College of Medicine and Cook County Hospital.

In 17 out of 18 patients injection of a water-soluble compound with vitamin K activity was effective. Failure in the eighteenth case was ascribed to the fact that the patient's liver, necessary for utilization of vitamin K by the body, had been completely destroyed by illness.

Injection of the vitamin brings a quick response, the doctors found. Also, the injection eliminates the need for use of bile salts, which must be given along with the vitamin when it is taken by mouth.

Science News Letter, February 22, 1941

PHARMACY

Blood Will Be Included In Pharmacopoeia

BOTTLES and flasks of vital red fluid stored in hospitals for emergency lifesaving may in the future bear labels reading: BLOOD U. S. P. The three letters are initials for the Pharmacopoeia of the United States, and when they are on the label of a bottle the contents of that bottle must, by law, come up to the standards described for the substance in the Pharmacopoeia.

Whole blood, blood serum and blood plasma for transfusion are recommended for inclusion in the twelfth revision of the Pharmacopoeia, Dr. E. Fullerton Cook, chairman of the revision committee of the U. S. Pharmacopoeia, announces. The Pharmacopoeia is revised every 10 years, with occasional interim revisions to keep up with the rapid development of scientific knowledge.

Quinine, according to Dr. Cook's announcement, may come out of the next Pharmacopoeia. This will surprise you unless you know that physicians nowadays seldom prescribe quinine for treatment of malaria. Instead, they prescribe

various salts of quinine such as quinine sulfate. These will remain in the Pharmacopoeia.

Antipneumococcus serum, immune serum for scarlet fever, and immune serum for measles are recommended for the U. S. P. XII. So is tetanus toxoid. Among other articles recommended for inclusion are radium, nicotinic acid amide, halibut liver oil, vitamin A and D in oil, riboflavin (one of the B vitamins), and cortin, an adrenal gland extract used in treatment of Addison's disease. Extract of rice polishings, standardized for vitamin B₁ potency for use in the Philippines, is also recommended for inclusion.

Among recommended deletions of articles now in the Pharmacopoeia are such standbys of grandfather's day as asafetida, cantharides, capsicum, pepsin, iodoform, powder of ipecac and opium, creosote, and one reminiscent of the World War surgery, modified Dakin's solution.

Science News Letter, February 22, 1941

AERONAUTICS

Simple Airplane Engines Made From Auto Parts

ISSUANCE of a type certificate for a new type aircraft engine of 93 horsepower and constructed 70 per cent. of the precision parts from a Ford V8 automobile motor was announced by James Church, veteran aeronautical engineer. The certificate was issued by the Civil Aeronautics Authority.

The new engine is air cooled and is slightly heavier than other aircraft engines of comparable power, but this weight consideration is expected to be offset by the fact that it will cost only about one-third as much. The inventor said he expected to sell his new motor for \$350, including starter and generator as standard equipment. Lighter airplane motors now cost from \$1,100 to \$1,200 each, without accessories.

Endurance and flight tests of the new motor have been completed.

One of the features of the new motor is the fact that replacement parts can be had at any of the more than 35,000 Ford service stations in the United States.

Mr. Church is preparing to launch large-scale production of the engine, and he is also building a three-place airplane especially designed for this motor. Both plane and engine will be manufactured in Chicago and the complete aircraft will cost under \$2,000, Mr. Church announced.

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CHEMISTRY

Grain Sorghum Seen as Possible Source for Starch

STARCH may soon be made commercially from kafir, a grain-yielding sorghum, research work at Kansas State College indicates.

J. W. Greene, assistant professor of chemical engineering, has been seeking some way to use kafir since his project began on July 1, 1937. Recently he reported that it may be possible to start this new industry within a few months if proper progress is made. Already numerous advancements toward the projected goal have been made.

The fact that kafir possesses starch as a component part has been known for years but chemists have had difficulty separating it from the rest of the grain on a profitable scale for commercial use.

Prof. Greene and his research assistants have been interested mainly in processing the starch and finding new uses and commercial application. Prof. H. N. Barham of the Department of Chemistry of Kansas State College has been studying the properties of the starch. This work of testing, studying and examining the tiny kernels of grain has gone on for two and a half years and, although months of work admittedly are still ahead, the research workers believe that the success of their project seems almost certain.

Advances of kafir over corn are cheaper production, possibility of processing more cheaply and increased value per unit of material. If the project lives up to present hopes, farmers of the plains may plant hundreds of acres in kafir. This land is that which now is wind-swept, arid land in the section formerly known as the dust bowl. The crop would tie the soil with its root systems and yet yield a profitable crop.

Science News Letter, February 22, 1941

ORNITHOLOGY

Wildlife Photographer Catches Some Odd Poses

See Front Cover

THE BIRD with the very peculiar expression, shown on the front cover of this week's SCIENCE NEWS LETTER, is a western grebe that tried to get saucy with the manager of the Sacramento National Wildlife Refuge in California.

The picture is one of a number of unusual photographs taken officially by the U. S. Fish and Wildlife Service.

Science News Letter, February 22, 1941

ASTRONOMY

Moon Enters Earth's Shadow

March Will Bring First Lunar Eclipse Since 1939; Annular Eclipse of Sun Visible in South America

By JAMES STOKLEY

WHEN the moon enters partly into the shadow of the earth during the night of March 12, the first eclipse visible since October, 1939, will be presented to the residents of most of the United States and Canada. Only in the western part of North America, however, will the entire phenomenon be seen. For the eastern areas, the moon will set before it is completely revealed again.

As must be the case for such an eclipse, the moon will then be full. It will stand in the direction of the constellation of Leo, the lion. This figure is high in the southeast in the evening, as shown on the accompanying maps. They are prepared to reveal the sky's appearance at 10:00 p. m. in the beginning of the month and 8:00 p. m. at the close. Since the main part of the eclipse happens after midnight, in the early morning hours of March 13, Leo will then be in the west.

Despite the fact that this is only a partial eclipse, it will be an interesting spectacle, one well worth getting up early to see. The earth's shadow has two parts—an inner core, the umbra, where the sun would be completely hidden; and, around it, the penumbra, from which an observer in space would see the earth only partly in front of the sun.

As 4:38 a. m., eastern standard time (central time one hour earlier, mountain time two hours earlier, and Pacific time three hours earlier) the moon starts going into the penumbra, but this will not produce any noticeable effect. About an hour later, however, the northeastern edge of the moon will be seen noticeably darker, and at 5:55 a. m., E. S. T., this part comes into the umbra. An hour later, it is most completely immersed in the shadow, which then covers a little less than a third of the lunar diameter.

Two interesting things can be observed as the eclipse progresses. The shaded part has a coppery red color, for even the umbra is illuminated, with sunlight that has been bent into it by the earth's atmosphere, acting as a prism. Light that penetrates the atmosphere is red, the blue rays having been scattered from it to cause the blue color of the daytime sky.

Also, the edge of the earth's shadow is seen on the moon's face as a circular arc. Centuries ago men recognized this as one of the best proofs that the earth is a ball, since only a spherical object always casts a circular shadow, regardless of the direction from which the light comes.

At 7:56 a. m., E. S. T., the moon will have left the umbra, and at 9:13 a. m., it will be out of the penumbra also. Except in the western part of the country, of course, the moon will have set, and the sun risen, when these later phases of the eclipse happen.

As a matter of fact, this is not the only eclipse of March, for there is one of the sun two weeks later, by which time the moon is new, having swung around from a place opposite the sun to one that is toward it.

Because, however, the moon will then be relatively far away, it will not appear quite as large as the sun. Even where it passes in front of that orb, a ring of the solar surface will appear around the black lunar disk.

This is called an "annular" or ring-shaped eclipse. Even though most of the sun is hidden, the small portion that remains is enough to blot out the sun's corona, and the other features for which astronomers send expeditions to see eclipses.

The path over which the annular eclipse will appear on March 27 starts in the Pacific Ocean east of New Zealand. Though the sun will be rising there, it will be 1:26 p. m., E. S. T., in the United

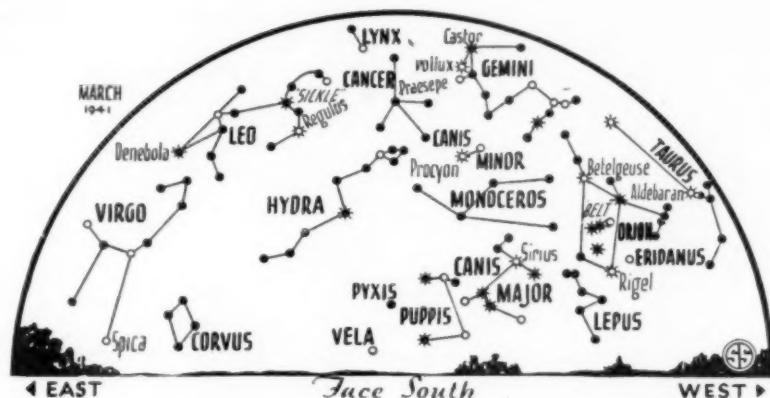
States. Then the path goes just to the north of Easter Island, reaches the coast of Peru, sweeping over the cities of Lima, Huancayo and Maldonado, and ends in interior Brazil. Over most of Central and South America and the southern Pacific Ocean, the sun will be seen partly covered, but the United States will not even get as much as that.

Another kind of eclipse—technically called an "occultation," when the moon covers a star, may be watched with interest by astronomers around noon on March 5. Aldebaran, brightest star in Taurus, the bull, is so occulted. The event is visible over the eastern half of the country. Happening in the daytime, it will not be visible to the naked eye, but a telescope shows a star, even when the sun is shining. Such occultations afford an excellent means of checking the moon's motion, and Aldebaran is the brightest star that can be occulted.

As it has been for many months, Jupiter continues as the most spectacular star or planet in the evening. Shining to the west in Aries, the ram, it sets about four hours after the sun. Below it and quite bright also, compared with the stars, is Saturn. Jupiter passed Saturn last month, but now they are drawing apart.

Orion, the warrior, and his celestial neighbors, who so dominated the winter evening sky, have now shifted to the southwest, but still are most conspicuous. Orion himself we find by the three stars of his belt; Sirius, the dog star, in Canis Major, the great dog, most brilliant star of the night sky, is to the left. Above is Procyon, in Canis Minor and nearly overhead Castor and Pollux, the twins, Gemini. Taurus, with Aldebaran stands





• * • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

in the west, and Capella, in Auriga, the charioteer, to the northwest.

Other stars of the first magnitude seen on March evenings are Regulus, in the sickle, which is part of Leo; Arcturus, in Bootes, to the northeast, and Spica, in Virgo, the virgin, which is below and to the left of Leo.

A welcome astronomical event of the month comes on March 20, at 7:21 p. m., eastern standard time. Then, for the northern hemisphere, the season of spring commences.

Celestial Time Table for March

Saturday, March 1, 12:57 a. m., Algol at minimum. **Sunday, March 2,** 4:00 p. m., Moon farthest, distance 251,800 miles. **Monday, March 3,** 3:44 a. m., Moon passes Saturn; 5:31 a. m., Moon passes Jupiter; 9:46 p. m., Algol at minimum. **Wednesday, March 5,** about noon, Occultation of Aldebaran.

Thursday, March 6, 2:43 a. m., Moon at first quarter; 6:35 p. m., Algol at minimum. **Thursday, March 13,** early a. m., Partial eclipse of moon; 6:47 a. m., Full moon. **Friday, March 14,** 5:00 p. m., Moon nearest, distance 223,800 miles. **Monday, March 17,** 3:00 a. m., Neptune nearest, distance 2,716,000,000 miles. **Wednesday, March 19,** 9:51 p. m., Moon in last quarter. **Thursday, March 20,** 7:21 p. m., Vernal equinox; sun crosses equator and spring begins in northern hemisphere. **Friday, March 21,** 2:42 a. m., Algol at minimum; 4:31 p. m., Moon passes Venus. **Sunday, March 23,** 11:31 p. m., Algol at minimum. **Tuesday, March 25,** 6:08 a. m., Moon passes Mercury; 10:00 a. m., Mercury farthest west of sun. **Wednesday, March 26,** 8:20 p. m., Algol at minimum. **Thursday, March 27,** Annular eclipse of sun; 3:14 p. m., New moon. **Sunday, March 30,** 5:00 a. m., Moon farthest, distance 252,400 miles; 4:07 p. m., Moon passes Saturn; 11:11 p. m., Moon passes Jupiter.

Eastern standard time throughout.

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CHEMISTRY

Good May Come out of War By New Scientific Discoveries

Many Important Chemical Developments Have Come From Search for Substitutes Made Necessary by War

IF ANYTHING good is to come out of the present war, perhaps it will be some new scientific discoveries and applications resulting from interest in what are so generally called 'ersatz,' Dr. Harrison E. Howe, editor of *Industrial and Engineering Chemistry* and Chemical Priority Executive in the Office of Production Management, declared before the New York Section of the American Chemical Society.

Many important chemical developments have come from the search for such substitutes, made necessary by war

or national emergency, in the United States and other countries, he stated. "The World War gave us the synthetic organic chemical industry," he said.

"Ersatz," according to Dr. Howe, is only another instance in history where science has been used to lift a nation out of its difficulties. Science also broke blockades by discovering beet sugar, oleomargarine, and how to make soda from common sea salt, Dr. Howe pointed out.

When the price of sugar increased extraordinarily on the Continent because of

Napoleonic policy, Franz Carl Achard in 1801 established a beet sugar factory near Breslau in Silesia, using the knowledge learned from his professor, Andreas Sigismund Marggraf of the Berlin Academy of Sciences, who in 1747 first discovered the existence of common sugar in beetroots. Beetroot sugar factories were soon started in many centers in Germany and France.

Oleomargarine was first made in 1870 by a French chemist, Mege-Mouries, who experimented to obtain a cheap butter substitute for the benefit of the poor. Another French chemist, Nicolas Leblanc, in 1787 was attracted to the urgent problem of manufacturing carbonate of soda from salt. In 1792 he was granted a patent for his process, and a factory was started near Paris. As a result of the French Revolution, the factory was confiscated soon after its opening.

Dr. Howe pointed out a fundamental difference between American "ersatz" materials born of research and those produced in Germany. Ours, he said, are supplements and equivalents of the things which they replace, rather than makeshift products.

"Our scientists have displayed persistence, ingenuity, invention, and powers of discovery equal to those from overseas," said Dr. Howe.

"Our 'ersatz' covers a wide range of articles. We too have produced synthetic fibers, new resins, and clad metals. These new things are obliged to make their way on their merits because fortunately we can still decide what to use and how to spend our dollars. Consequently our 'ersatz' materials must make their way on price and service."

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MEDICINE

Simplified Iron Lung Covers Only the Torso

ASIMPLIFIED iron lung, used for aiding artificial breathing, in the treatment of conditions when the respiratory muscles fail to function, has recently been invented. It encloses only the patient's torso. New means are used for the prevention of air leaks, which are especially troublesome in a small respirator, with its limited total volume of air. (Patent 2,227,847, Theodore J. Shoolman, Brookline, Mass.)

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War has delayed England's nylon yarn production, but nylon is being developed for surgical thread, brush bristles and fishing lines.



AGAINST COLD AND MOSQUITOES

HEALTH

U.S. Soldiers In Alaska Get Super-Warm Togs

At Quartermaster Corps Offices, Dummies Display Correct Garb for Various Climates Soldiers May Meet

WEARING a \$300 outfit, from elbow-length shaggy fur mittens to reindeer skin coat and polarized snow-glare goggles, Uncle Sam's soldiers assigned to Far Northern air bases and posts are Alaska's best dressed men this winter.

Let the thermometer dive to 50 below zero in the bitter cold Yukon valley, where the U. S. Army has one of its largest air bases at Ladd Field, Fairbanks! Let the frozen ground thaw to soggy, chill

mud of the famed Alaskan variety, when summer comes! Togs such as the average American never sees in a lifetime are included for the worst Alaskan weather in the Far Northern army outfit.

Inside the wardrobe room at Quartermaster Corps offices, a whole line of sentries appears to challenge entrance. Sentries? No. In better light, store dummies wearing correct garb for America's soldiers in various climates and on various duties.

End man, ready for sub-zero cold, in the War Department's steam heat, is muffled in khaki-colored duck parka—far northern overcoat with hood attached. The parka is fur-lined and fur-trimmed and in front is a handy big pouch to tuck mittened hands in, muff fashion.

Impressive in the parade of garments for making soldiers comfortable in the Far North are these:

Fur mittens are the warmest hand protectors in the Alaskan soldier's equipment. They look big enough for giant arms.

Arctic stockings provided for bitterest cold are the heaviest socks made for men, Army experts say. They are of gray knitted wool, long enough to pull above the knee, and thick and huge all over.

Several parkas and windbreakers are provided for various seasons and types of weather. The heaviest is a reindeer skin parka with zipper, easy to manage when fingers are stiff with cold.

Alaskan defense offers a style idea that civilians may copy: a worsted toque which is a long sausage of gray wool. Worn in sausage form, it makes a warm neck scarf. Tuck one end inside the other and—presto!—you have the toque, double thick for head wear.

A fur-lined hood that goes with a windbreaker jacket is equipped with a nose-protector, a fur-lined strip attached at the sides of the hood.

Skis and snowshoes go with the American soldier's Far Northern outfit. But none of the white sheet effects that Finnish soldiers made famous are being rationed to these men. White camouflage is for fighting wear.

Huge hip boots of rubber and green Sou'wester oilskins remind you that frozen ground in Arctic Alaska is apt to thaw to mud a foot deep in summer. And soldiers may be detailed where wind and rain are familiar weather problems.

Surprise item, if you don't know Alaskan mosquitoes, is a head net, large and green, like something a cautious bee keeper might wear. Mosquito blitzkriegs in some areas of Alaska are fierce enough to make a sentry miserable, minus mosquito net armor.

Examining the long list of garments required for comfort and efficiency in Far Northern defense duties, it is easy to see why the Quartermaster Corps spends about three times as much to equip these soldiers as it needs to spend on a man sent to warmer posts.

Quartermaster officers emphasize that heaviest, cumbersome items of clothing, winter essentials in frigid Alaska, are

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not being rationed to soldiers in warmer sections of the same territory. Around Annette Island and Metlakatla in the panhandle, January temperatures average near 32 degrees Fahrenheit.

America remembers the report that

too heavy equipment burdened down British soldiers sent to Norway last spring. Norway in spring was far milder than winter in Finland. Understanding local climate conditions is important in dressing an army.

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PSYCHOLOGY-AERONAUTICS

Pictures on Screen Train Crews of R.A.F. Planes

Students Must Plot Course from Navigation Instruments Under Control of Instructor and Landmarks on Screen

PICTURES thrown on a screen from a projector fundamentally similar to the kind once used in the home to show postcards or snapshots, are playing an important part in the ground training of crews for R. A. F. bombing planes. (*Flight*, Jan. 9.)

A row of six cubicles, each fitted with navigational instruments under the control of an instructor, is at one end of a room, facing a large white screen on which the pictures are shown. The students enter these cubicles, where they have only "radio" contact with the instructor.

"Each member of the crew does his job exactly as though he was in the air," says the writer. "Only the normal cockpit lighting is available. Out on the screen the words 'take off' appear and the clock is set. The navigator plots his course and the wireless operator, with his direction finding loop, gets 'fixes' every so often. The pilot watches his speed and compass bearing. Now and again the instructor causes an aerial picture to be shown on the screen with the note that it has appeared, say, two miles on the port side or some such observation. It is only there for a very short while, and the crews have to identify it and check their course.

"Occasionally when a landmark should appear, the picture is of ten-tenths cloud and the flight must go on by direction finding and dead-reckoning. As the target is approached the pictures are almost obscured by shining the searchlights (i.e., torches) directly in the crews' faces, making it difficult for them to see the picture. Meanwhile a series of tiny pinpoint flashes appear on the picture to imitate gun flashes. The whole illusion is very complete, especially when, as is often the case, the tracks covered are those leading to actual targets which the crew will soon be bombing."

Another device trains the gunners in use of the power-operated turrets. Earlier planes were equipped with machine gun turrets that were turned by the gunner himself. At high speeds, however, the rush of air made it necessary to use considerable force to operate the turret, so that accuracy was impaired. To avoid this, power turrets are now used, which are moved mechanically by the gunner's lightest touch. American planes, as well as those of Great Britain and other countries, are now equipped with them.

"For the instruction of air-gunners there is the Spotlight Trainer," it is stated. "This is in a darkened hangar. On a Whitley airframe there is the standard Nash and Thompson power-operated turret with a central barrel fitted between the guns. This central barrel can—at the will of the instructor—be made to shine a point of light on a screen. The instructor has a hand projector which throws moving images of enemy machines on the screen. The gunner shoots at these, allowing the necessary deflection for speed and altitude, and every few seconds the instructor switches on the central barrel spotlight to check the gunner's aim."

The writer quotes a volunteer Amer-

RADIO

Ivan Booker, of the National Education Association, and William S. Gray, director of Teacher Training, University of Chicago, speaking from the N.E.A. meeting, will discuss the subject "Learning to Read" as guest scientists with Watson Davis, director of Science Service, on "Adventures in Science," over the coast to coast network of the Columbia Broadcasting System, Thursday, Feb. 20, 3:45 p.m. EST, 2:45 CST, 1:45 MST, 12:45 PST. Listen in on your local station. Listen in each Thursday.

ican airline pilot who had joined the R. A. F. and finished the training course. "Although I am the pilot," he said, "I must know everybody else's job. I must know wireless, I must know meteorology, I must know navigation of all kinds, I must know how to drop bombs, I must know my guns, my bombs, my flares, my camera, my oxygen apparatus, my airframe, my engine and, above all, I must know my crew."

This same pilot explained the difference between a good fighter pilot and a good bomber pilot as follows:

"If you're a fighter-pilot and you're careful you're as good as dead. If you're a bomber-pilot and you're not careful you're even deader."

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CHEMISTRY

Washers for Faucets From Artificial Rubber

WASHERS for faucets are among the latest items to be made from artificial rubber. They are said to have twice the shelf and service life of washers made from natural rubber. (*Kirkhill Rubber Co., 811 W. 58th St., Los Angeles, Calif.*)

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INTERESTED? in Science



PURPLE-X Ultra-Violet lamp—a powerful source of U.V. (250 watts, 50 hours, 110 volts, ordinary socket). Minerals, dyes, vaseline, natural teeth shine in its rays. Fun on a party, see who has false teeth or paint skull on face with vaseline. Useful to teachers. \$2.00, express chgs. collect.

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From Page 119

mum in the polar regions; it is directly caused by a solar eruption."

Dr. L. V. Berkner, of the Department of Terrestrial Magnetism of the Carnegie Institution of Washington, explained to the meeting how the various layers of the ionosphere are measured by sending up radio waves and catching their echoes. There are three main layers, he stated, namely: the E-layer, 62 miles high; the F-1 layer at 140 miles and the F-2 layer at 220 miles. At night, or when the sun is low, the last two merge to form a single F layer at a level of 155 miles.

Apparently corpuscles shot out from the sun disturb the F layers in which, he stated, occur the chief ionospheric effects associated with magnetic storms.

Dr. Carl W. Gartlein, curator of the Department of Physics at Cornell University, told of connections, which he has found, between the earth's magnetism and the aurora borealis. Auroras occur most frequently, he said, in a zone about 23 degrees from the magnetic pole, which is on the Boothia Peninsula in northern Canada. The 23 degree zone roughly follows the border between the United States and Canada.

"The disturbances of the geomagnetic field, or magnetic storms, occur most frequently near the equinoxes," Dr. Gartlein announced. "Auroras are likewise most frequent then in the middle latitudes (45 degrees to 60 degrees geomagnetic latitude). There is also an approximate eleven-year cycle in the number and intensity of magnetic storms which has its counterpart in displays of aurora. These cycles rise to a maximum about a year after the peak of the sunspot cycle. Large magnetic storms are always accompanied by auroral displays in middle latitudes and these displays move farther from the poles during more intense storms. Near the poles the magnetic storms and auroral displays are not always simultaneous."

Science News Letter, February 22, 1941



Rosette Plants

SOME plants ages ago learned the trick adopted by modern soldiers, of lying down flat when exposed to enemy fire. The enemy fire, in their case, consists of snow and sleet of winter, and the plants lie down by forming mats or rosettes that hug the ground, gaining cover and protection from the very snow that would otherwise overwhelm them. We see perfect examples of such low-lying rosettes in dandelion, mullein, plantain and similar weeds. As a matter of fact, they are weeds simply because they are so successful as plants, gaining and keeping roothold in a million places where they are not wanted.

Plants able to produce leaves sufficiently tough to withstand winter's cold have a quite considerable advantage over less resistant species that must tuck next year's foliage tightly into buds, as most woody plants do, or hide beneath the ground surface, like most perennial herbs, or even pack the tiny beginnings of the whole plant away within seeds, after the manner of all annuals. A rosette plant has its leaves all there, spread out and ready to catch the sun, the moment the snow covering is thawed away. That is the reason why the first spring flowers

that adorn city dwellers' buttonholes are usually dandelions—precocious blooms that pop out, far ahead of the season, in sheltered sunny spots.

The rosette habit gives other advantages to early-starting plants. The circle of leaves preempts the ground beneath it, keeping it bare of the competition of other plants. At the same time, it affords a certain degree of protection against drying to the soil beneath, thus benefiting at least the more superficial part of its root system.

It is rather characteristic of plants that form winter rosettes, to forsake the meek humility of their beginnings and send their flower stalks aloft as far as they can reach, when time for reproduction comes. Thus, the tall, bare scapes of the dandelion, the ambitious, wiry spikes of the plantain, the truly towering growth of the mullein in its second year. It is truly a case of the meek inheriting the earth—by becoming self-assertive.

Science News Letter, February 22, 1941

The *Ross Shelf Ice*, sometimes called the barrier, in the Antarctic is a vast floating sheet of snow-ice rising cliff-like from the Ross Sea 20 to 200 feet.

● Earth Trembles

Information collected by Science Service from seismological observatories and relayed to the U. S. Coast and Geodetic Survey resulted in the location of the following preliminary epicenters:

Friday, Feb. 7, 10:13.1 a.m., EST

On Kamchatka peninsula. Probably in region of Latitude, 56 degrees north; longitude, 158 degrees east.

Sunday, Feb. 9, 4:43.9 a.m., EST

Off coast of northern California. Latitude, 41 degrees north. Longitude, 127 degrees west. Strong.

Tuesday, Feb. 11, 9:35.5 a.m., EST

Probably about 100 miles off west coast of lower Mexico, near Guatemala boundary. In region of latitude, 14 degrees north; longitude, 94 degrees west. Strong shock.

Stations cooperating with Science Service in reporting earthquakes recorded on their seismographs are:

University of Alaska, College, Alaska; Apia Observatory, Apia, Western Samoa; University of California, Berkeley, Calif.; Dominion Observatory, Ottawa; Dominion Astrophysical Observatory, Victoria, B. C.; The Franklin Institute, Philadelphia; Harvard University Observatory, Harvard, Mass.; University of Hawaii, Honolulu; Magnetic Observatory of the Carnegie Institution of Washington, Huancayo, Peru; Massachusetts Institute of Technology, East Machias, Maine; University of Michigan, Ann Arbor, Mich.; Manila Observatory, Manila, P. I.; Montana School of Mines, Butte, Mont.; Montana State College, Bozeman, Mont.; Nebraska Wesleyan University, Lincoln, Neb.; Pennsylvania State College, State College, Pa.; Phu Lien Observatory, near Hanoi, French Indo-China; Seismological Observatory, Pasadena, Calif.; University of Pittsburgh, Pittsburgh, Pa.; University of South Carolina, Columbia, S. C.; University of Utah, Salt Lake City, Utah; Utah State Agricultural College, Logan, Utah; U. S. Weather Bureau, University of Chicago; Williams College, Williamstown, Mass.; Zikawei Observatory, near Shanghai, China; observatories of the Jesuit Seismological Association at Canisius College, Buffalo, N. Y.; Fordham University, New York City; Georgetown University, Washington, D. C.; St. Louis University, St. Louis, Mo.; St. Xavier College, Cincinnati, and Weston College, Weston, Mass.; observatories of the U. S. Coast and Geodetic Survey at San Juan, P. R., Sitka, Alaska, Tucson, Ariz., and Ukiah, Calif.

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•First Glances at New Books

Additional Reviews
On Page 128

NAVAL SCIENCE

MINE AND COUNTERMINE — A. M. Low—*Sheridan House*, 224 p., illus., \$2.75. A thorough-going account of that unromantic but highly effective naval weapon, the submarine mine, by a British scientist who has specialized in mines and mining. Full historic background shares space with descriptions of modern tactics and technique.

Science News Letter, February 22, 1941

BIOCHEMISTRY

MECHANISMS OF BIOLOGICAL OXIDATIONS — David E. Green — *Cambridge (Macmillan)*, 181 p., \$2.75. A treatise in one phase of enzyme chemistry which will be welcomed by physiologists and others whose work brings them in contact with special problems of oxidation reactions in living organisms and in the more complex non-living organic materials.

Science News Letter, February 22, 1941

MEDICINE—BIOGRAPHY

HUGH YOUNG, A Surgeon's Autobiography — Hugh Young — *Harcourt, Brace*, 554 p., illus., \$5. A very entertaining book containing, among other things, Dr. Young's own explanation for the layman of urological surgery which he has done so much to develop.

Science News Letter, February 22, 1941

PRINTING—HISTORY

PRINTING IN THE FIFTEENTH CENTURY — George Parker Winship — *Univ. of Penn. Press*, 158 p., \$2. What happened in Europe when the Gutenberg invention of movable type appeared is one of the dramatic stories of industry and revolutionary change. Mr. Winship knows his subject from 40 years as custodian of notable fifteenth-century book collections.

Science News Letter, February 22, 1941

PSYCHOLOGY

HOW YOU CAN GET A BETTER JOB — Willard K. Lasher and Edward A. Richards — *American Technical Society*, 174 p., illus., \$1.50. A book of personal advice for the young fellow who wants to get ahead.

Science News Letter, February 22, 1941

ECONOMICS—GEOGRAPHY

PRINCIPLES OF ECONOMIC GEOGRAPHY — Ellsworth Huntington and others — *Wiley*, 715 p., illus., \$4. Remembered facts become useful tools and fit into pigeonholes, Prof. Huntington explains,

when the student has mastered basic principles. Hence, this text analyzes the elements of economic geography, from simple to complex, ending with a study of manufactures in present day United States.

Science News Letter, February 22, 1941

TYPOGRAPHY

THE ORIGIN OF PRINTING IN EUROPE — Pierce Butler — *Univ. of Chicago Press*, 154 p., illus., \$1.50. An historic study, emphasizing the mechanical developments of early printing, and devoting considerable space to the mysterious Gutenberg. Citing a number of medieval documents, the writer concludes that Gutenberg scarcely rates such peculiarly high honors as have been widely accorded him.

Science News Letter, February 22, 1941

GENERAL SCIENCE

EXHIBITION TECHNIQUES, A Summary of Exhibition Practice — *New York Museum of Science and Industry*, 131 p., illus., \$2. Taking the latest world's fair exhibits apart on paper, to show what makes them tick, these surveys analyze psychological factors involved in a successful exhibition. Outstanding exhibition techniques at the New York and San Francisco fairs provided the basis for these studies, which should offer many ideas to museums and exhibit planners.

Science News Letter, February 22, 1941

MEDICINE

FOUNDATIONS OF SHORT WAVE THERAPY: Physics, Technics, Indications — Wolfgang Holzer and Eugen Weissenberg; Trans. by Justina Wilson and Charles M. Dowse — *Chem. Pub. Co.*, 228 p., illus., \$5.

Science News Letter, February 22, 1941

NATURAL HISTORY

JUNGLE IN THE CLOUDS — Victor Wolfgang v. Hagen — *Duell, Sloan and Pearce*, 260 p., illus., \$3. An explorer tells of his journeyings in search of the rare and elusive quetzal bird with romantically readable text and excellent photographic illustrations.

Science News Letter, February 22, 1941

ZOOLOGY

A GENERAL ZOOLOGY OF THE INVERTEBRATES — G. S. Carter — *Macmillan*, 509 p., illus., \$5.50. A well-developed text of English authorship, in which principal emphasis is on biological rather than on taxonomic aspects.

Science News Letter, February 22, 1941

CHILD STUDY

FEEDING OUR OLD FASHIONED CHILDREN — C. Anderson Aldrich and Mary M. Aldrich — *Macmillan*, 112 p., illus., \$1.75. Babies, these authors believe, are old-fashioned enough to get hungry. And they can be depended upon to eat when they are hungry. The job of parents is to provide the right kind of food at the time the child wants it.

Science News Letter, February 22, 1941

HORTICULTURE

PLANTS AND CHEMICALS — W. E. Bott — *Pub. by author, P. O. Box 2648, Lakewood, Ohio*, 32 p., 25c. Directions for chemical experiments with plants. Particular attention is given to recent results with colchicine growth-promoting substances, and water cultures. Intended particularly for the serious hobbyist.

Science News Letter, February 22, 1941

ENGINEERING

COFFERDAMS — Lazarus White and Edmund Astley Prentis — *Columbia Univ. Press*, 273 p., illus., \$7.50. A cofferdam is "a temporary structure built to exclude earth and water from an excavation so that work may be done in the dry." In the Federal program of providing a nine-foot channel in the Mississippi River from St. Louis to St. Paul, it was necessary to build twenty-six dams with locks, each lock and dam requiring at least three large cofferdams. This is the most extensive use they have ever had, and the authors of this book were associated with that project for six years. Here they have summarized the facts that they have learned by experimentation and actual practice, and have produced a work which should be of great value to the engineering profession.

Science News Letter, February 22, 1941

ESSAYS ON THE NEW VORTEX ATOM

by Carl F. Krafft

A new geometric system of atomic structure in which the atom has a structural center, but no nucleus.

The one distinguishing characteristic of all atomic particles is their localized persistence of individuality, and this is also the distinguishing characteristic of vortex motion. The atom must therefore consist of vortex motion.

Free upon request

C. F. Krafft, 2510 Q St. N. W., Wash., D. C.

•First Glances at New Books

Additional Reviews
On Page 127

AERONAUTICS

THE MEASURE OF AMERICA'S WORLD WAR AERONAUTICAL EFFORT—Edgar S. Gorrell—*Norwich University*, 78 p., 50 c. With America's present effort to rearm, it may be particularly illuminating to find out exactly what we did in 1917-18. Many and often conflicting are the accounts of those days. Colonel Gorrell has gone to the ultimate sources, the carefully checked, official "Final Report of the Chief of the Air Service, AEF," a typewritten document in 60 volumes, the only set of which reposes in the War Department vaults out of reach of most inquirers. Though obviously condensed to the utmost, Colonel Gorrell's publication summarizes many of the most important data from that report, so it will form an authoritative fountain of authentic information.

Science News Letter, February 22, 1941

EXPLORATION

DERSU THE TRAPPER—V. K. Arseniev; Trans. by Malcolm Burr—*Dutton*, 352 p., illus., \$3. Semi-fictional account of explorations in eastern Siberia, translated from the Russian. So fascinatingly written that it is hard to put the book down; which makes it all the more a pity that the illustrations are not better.

Science News Letter, February 22, 1941

BOTANY

STUDIES OF CENTRAL AMERICAN PLANTS, II—Paul C. Standley and Julian A. Steyermark—*Field Museum of Natural History*, 71 p., 50 c.

Science News Letter, February 22, 1941

CONSERVATION

CONSERVATION OF AMERICAN RESOURCES—Charles N. Elliott—*Turner E. Smith & Co.*, 672 p., illus., \$1.80. A book written so that it can be used with good effect as a high school text, or as a foundation-book in summer camps where the nature-study program is taken really seriously. It presents conservation problems fully and clearly and gives practical ideas about what can be done toward their solution. Suggestions for study and activities form stimulating appendices for each chapter.

Science News Letter, February 22, 1941

BIOLOGY—HUMOR

NATURE SMILES IN VERSE—Bernal R. Weimer, comp.—*Pub. by comp., Bethany College, Bethany, W. Va.*, \$1.50. A little book of humorous verses about scientific

subjects, mainly biological. Many of the old fireside favorites from places like Woods Hole and Cold Spring Harbor are here, together with other poems not so widely known, including a surprising number from the pens of famous authors. This collection will find a warm welcome wherever little groups of biology students get together, after laboratory hours or on a hike, for an hour or two of not-so-serious discourse.

Science News Letter, February 22, 1941

NAVY

THE FLEET TODAY—Kendall Banning—*Funk & Wagnalls*, 346 p., illus., \$2.50. A full and highly informative account of life in the U. S. Navy as it is lived by the enlisted man. The style is light and discursive, with a liberal salting of sea humor; nevertheless, the book is packed with facts. Everything that anyone would want to know seems to be covered, from ratings, pay and rations to types of training afforded and types of ships on which Uncle Sam's sailors serve.

Science News Letter, February 22, 1941

ZOOLOGY—BOTANY

PAPERS FROM TORTUGAS LABORATORY, Vol. XXXII—*Carnegie Institution of Washington*, 412 p., 12 pl., illus., paper, \$4; cloth, \$4.50. A group of research papers, ranging in subject from fish, invertebrates and algae in the water to the ecology of mangroves that line the shores.

Science News Letter, February 22, 1941

BIOLOGY

THE EMBRYOLOGY OF THE ECHIUROID WORM URECHIS CAUPO—William Wallace Newby—*American Philosophical Society*, 219 p., illus., \$2. This monograph constitutes what is probably the most detailed study ever made of the development of an invertebrate. It will for this reason have special interest for research students in biology.

Science News Letter, February 22, 1941

METEOROLOGY—AERONAUTICS

METEOROLOGY FOR AVIATORS—R. C. Sutcliffe—*Chemical Pub. Co.*, 317 p., illus., \$4. A highly practical text and reference work, of English origin, which should be useful in these days of intensive training for large numbers of new men for the air service. The range of subjects covered is very wide, and mathematical approaches are kept down to a minimum.

Science News Letter, February 22, 1941

MEDICINE

PLAGUE ON US—Geddes Smith—*Commonwealth Fund*, 365 p., illus., \$3. The story of man's fight against epidemic diseases, from plague to influenza, is here told so entertainingly that the book absorbs the interest even of one who has read the story many times before. Besides its readability, the book has the advantage of giving the latest scientific knowledge and theories. It has been chosen as the outstanding scientific book for February by the Scientific Book Club.

Science News Letter, February 22, 1941

SOCIOLOGY

NEW HAVEN NEGROES, A Social History—Robert Austin Warner—*Yale Univ. Press*, 309 p., \$3.50. The interesting style of this document will appeal to those who are not social scientists but who have concern for their fellow men. The author says, in conclusion: "One may dare believe that the rising social consciousness of the world today promises eventually to bring to Negroes, when the formative forces finally come to fruition, a new and more genuine Jubilee."

Science News Letter, February 22, 1941

ETHNOLOGY

THE HUPA WHITE DEERSKIN DANCE—Walter R. Goldschmidt and Harold E. Driver—*Univ. of Calif. Press*, 34 p., illus., 50c.

Science News Letter, February 22, 1941

ANTHROPOLOGY

PIONEERS IN AMERICAN ANTHROPOLOGY, The Bandelier-Morgan Letters, 1873-1883 (2 vols.)—Leslie A. White—*Univ. of New Mexico Press*, Vol. I, 272 p.; Vol. II, 266 p., illus., \$10 per set. These letters, says the editor's introduction, written between 1873 and 1883 "provide a fascinating study in the history of American anthropology for that period, as well as a study of a segment of the lives of that science's most brilliant and stalwart exponents." The letters are full of early discoveries and discussions on Southwest and Mexican Indian culture. An index is helpfully included, for reference use.

Science News Letter, February 22, 1941

ART—LITERATURE

JAPAN TALKS—Amar Lahiri—*Hokuseido Press, Kanda, Tokyo, Japan*, 227 p., illus., \$2. An interesting account of the art and literature of modern Japan.

Science News Letter, February 22, 1941